

AIR ECONOMIZER CONTROLS ACCEPTANCE

CEC-NRCA-MCH-05-A (Revised: 01/19)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-05-A
Air Economizer Controls Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

Compliance Results: AUTOMATED ("Complies" or "Does Not Comply")	Enforcement Agency Use: Checked by/Date
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Intent:	Construction inspection and functional testing for an air economizer to verify that the HVAC system can use outdoor air to satisfy space-cooling loads. Intended for air economizers that are NOT already certified to the Energy Commission. Submit one Certificate of Acceptance for each system that must demonstrate compliance. (NA7.5.4 , §140.4(e))
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A. Construction Inspection						
Building:		Floor:	Room/Area/Zone:		Control/System:	
Prior to Functional Testing, verify and document all of the following						
1.	Required documentation must be available for review (check all of the following).					
<input type="checkbox"/>	a.	All documentation shipped with the economizer including manuals and performance curves.				
2.	Verify the economizer is set to the Required High Limit setting according to the economizer Device Type and Climate Zone where installed (check one compliance path and all applicable NOTES). (Table 140.4-E , NA7.5.4.1(a) , §140.4(e)2C)					
Compliance Path for Required High Limit (Table 140.4-E)	Device Type		Climate Zone		Required High Limit Setting (Economizer off when :)	
					Equation	
					Description	
	<input type="checkbox"/>	Fixed Dry Bulb	<input type="checkbox"/>	1, 3, 5, 11-16	$T_{OA} > 75^{\circ}\text{F}$	Outdoor air temperature exceeds 75°F.
			<input type="checkbox"/>	2, 4, 10	$T_{OA} > 73^{\circ}\text{F}$	Outdoor air temperature exceeds 73°F.
			<input type="checkbox"/>	6, 8, 9	$T_{OA} > 71^{\circ}\text{F}$	Outdoor air temperature exceeds 71°F.
			<input type="checkbox"/>	7	$T_{OA} > 69^{\circ}\text{F}$	Outdoor air temperature exceeds 69°F.
	<input type="checkbox"/>	Differential Dry Bulb	<input type="checkbox"/>	1, 3, 5, 11-16	$T_{OA} > T_{RA}$	Outdoor air temperature exceeds return air temperature.
			<input type="checkbox"/>	2, 4, 10	$T_{OA} > T_{RA} - 2^{\circ}\text{F}$	Outdoor air temperature exceeds return air temperature minus 2°F.
			<input type="checkbox"/>	6, 8, 9	$T_{OA} > T_{RA} - 4^{\circ}\text{F}$	Outdoor air temperature exceeds return air temperature minus 4°F.
			<input type="checkbox"/>	7	$T_{OA} > T_{RA} - 6^{\circ}\text{F}$	Outdoor air temperature exceeds return air temperature minus 6°F.
	<input type="checkbox"/>	Fixed Enthalpy and Fixed Dry-bulb	All		$h_{OA} > 28 \text{ Btu/lb}$ or $T_{OA} > 75^{\circ}\text{F}$	Outdoor air enthalpy exceeds 28 Btu/lb of dry air or Outdoor air temperature exceeds 75°F.
<input type="checkbox"/>	Others such as Dew Point, Fixed Enthalpy, Electronic Enthalpy, and Differential Enthalpy Controls		May not be used in any Climate Zone in California unless approval for use is provided by the Energy Commission Executive Director. APPROVAL MUST BE ATTACHED.			
<input type="checkbox"/>	NOTE: Devices with selectable (rather than adjustable) setpoints must be set to within 2°F and 2 Btu/lb of the setpoint listed.					
<input type="checkbox"/>	NOTE for Fixed Enthalpy and Fixed Dry-bulb devices	At altitudes substantially different than sea level, the Fixed Enthalpy limit value must be set to the enthalpy value at 75°F and 50% relative humidity. As an example, at approximately 6,000 foot elevation, the fixed enthalpy limit is approximately 30.7 Btu/lb.				
3.	Economizer reliability features are present as specified in the Energy Code (check all of the following): (NA 7.5.4.1(h) , §140.4(e)2D)					
<input type="checkbox"/>	a.	5-year manufacturer warranty of economizer assembly (§140.4(e)2Di)				
<input type="checkbox"/>	b.	The economizer assembly (including but not limited to outdoor air damper, return air damper, drive linkage, and actuator) have been tested and are able to open and close against the rated airflow and pressure of the system for 60,000 damper opening and closing cycles. (§140.4(e)2Dii)				
<input type="checkbox"/>	c.	The outdoor air and return air dampers have a maximum leakage rate of 10 cfm/sf at 250 Pascals (1.0 of water) when tested in compliance with AMCA Standard 500-D. (§140.4(e)2Diii)				
<input type="checkbox"/>	d.	If the high-limit control is fixed dry-bulb or fixed enthalpy + fixed dry-bulb, then it must have an adjustable setpoint. (NA7.5.4.1(b) , §140.4(e)2Div)				

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A. Construction Inspection			
Building:	Floor:	Room/Area/Zone:	Control/System:
<input type="checkbox"/>	e.	Outdoor air, return air, mixed air, and supply air sensors must be calibrated as follows (check all of the following): (140.4(e)2Dv)	
<input type="checkbox"/>	i.	Drybulb and wetbulb temperatures accurate to $\pm 2^{\circ}\text{F}$ over the range of 40°F to 80°F	
<input type="checkbox"/>	ii.	Enthalpy accurate to ± 3 Btu/lb over the range of 20 Btu/lb to 36 Btu/lb	
<input type="checkbox"/>	iii.	Relative humidity (RH) accurate to $\pm 5\%$ over the range of 20% to 80% RH	
<input type="checkbox"/>	f.	Sensor performance curve(s) is provided with the economizer instruction materials that plotted data used for economizer control as well as plotted sensor output value measurements during calibration. (NA7.5.4.1(d) & (e), §140.4(e)2Dvi)	
<input type="checkbox"/>	g.	Sensors used for high limit control shall be located to prevent false readings, including but not limited to being properly shielded from direct sunlight. (NA7.5.4.1(c), §140.4(e)2Dvii)	
4.	Economizer additional features (check all of the following):		
<input type="checkbox"/>	a.	Economizer damper moves freely without binding. (NA7.5.4.1(f))	
<input type="checkbox"/>	b.	Unitary systems with an economizer have control systems, including two-stage or electronic thermostats, that cycle compressors off when economizers can provide partial cooling (NA7.5.4.1(g))	
<input type="checkbox"/>	c.	System has return fan speed control, relief dampers, or dedicated relief fans to prevent building over pressurization in full economizer mode. (NA7.5.4.1(i))	
<input type="checkbox"/>	d.	For systems with DDC controls, sensor used for economizer lockout has been factory or field calibrated. (NA7.5.4.1(j))	
<input type="checkbox"/>	e.	For systems with non-DDC controls, manufacturer's startup and testing procedures have been applied. (NA7.5.4.1(k))	
Construction Inspection Compliance Results: AUTOMATED ("Complies" or "Does Not Comply")			
B. Functional Testing			
Building:	Floor:	Room/Area/Zone:	Control/System:
Step 1:	Disable demand control ventilation systems (if applicable) (NA7.5.4.2 Step 1)		
Step 2:	Enable the economizer and simulate a cooling demand large enough to drive the economizer fully open (record all of the following): (NA7.5.4.2 Step 2)		
	a.	Economizer damper modulates 100% open and that the return air damper modulates 100% closed. (NA7.5.4.2 Step 2a)	P/F
	b.	All applicable fans and dampers operate as intended to maintain building pressure. (NA7.5.4.2 Step 2b)	P/F
	c.	The unit heating is disabled (if applicable). (NA7.5.4.2 Step 2c)	P/F
Step 3:	Disable the economizer and simulate a cooling demand (record all of the following): (NA7.5.4.2 Step 3)		
	a.	Economizer damper closes to its minimum position. (NA7.5.4.2 Step 3d)	P/F
	b.	All applicable fans and dampers operate as intended to maintain building pressure. (NA7.5.4.2 Step 3e)	P/F
	c.	The unit heating is disabled (if unit has heating capability). (NA7.5.4.2 Step 3f)	P/F
Step 4:	If unit has heating capability, simulate a heating demand and set economizer so that it is capable of operating (i.e., actual outdoor air conditions are below lockout setpoint). (record all of the following): (NA7.5.4.2 Step 4)		
	a.	Economizer is at minimum position. (NA7.5.4.2 Step 4g)	P/F/NA
	b.	Return air damper opens. (NA7.5.4.2 Step 4h)	P/F/NA
Step 5:	Turn off the unit. (NA7.5.4.2 Step 5) Record if the Economizer damper closes completely. (NA7.5.4.2 Step 5i)		
Step 6:	Restore demand control ventilation systems (if applicable) and remove all system overrides initiated. (NA7.5.4.2 Step 6)		
Functional Test Compliance Results: AUTOMATED ("Complies" or "Does Not Comply")			

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip	Phone:	Date Signed: